PAT-NO: WO009732268A1

DOCUMENT-IDENTIFIER: WO 9732268 A1

TITLE: AUTOMATED SYSTEM FOR IDENTIFYING ALTERNATE LOW-COST TRAVEL ARRANGEMENTS

PUBN-DATE: September 4, 1997

INVENTOR-INFORMATION:

NAME	COUNTRY
LYNCH, MICHAEL F	N/A
TURNER, JONATHAN A	N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
ELECTRONIC DATA SYST CORP	US

APPL-NO: US09702848

APPL-DATE: February 24, 1997

PRIORITY-DATA: US61010796A (February 29, 1996)
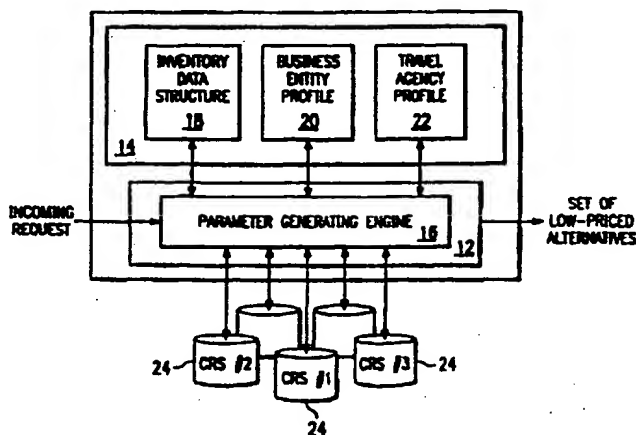
INT-CL (IPC): G06F017/60

EUR-CL (EPC): G06F017/60

ABSTRACT:

CHG DATE=19990617 STATUS=O>An automated system (10) is provided for identifying alternate low-cost travel arrangements. The system (10) obtains inventory information, specifying the rates and/or availability of a plurality of travel arrangements, from one or more computer reservation systems. The inventory information is stored in a database (14) along with one or more portfolios of information (relating to a travel agency and each business entity customer of the travel agency) that can be used to discount the listed rates of the travel arrangements. In response to travel request information received from a customer, the system (10) automatically retrieves the inventory and/or discount information from the database (14) and determines a plurality of low-cost alternate travel arrangements that are available to the customer. Consequently, a travel agent using the system (10) does not have to spend time manually identifying alternate low-cost travel arrangements.

(54) Title: AUTOMATED SYSTEM FOR IDENTIFYING ALTERNATE LOW-COST TRAVEL ARRANGEMENTS

(57) Abstract

An automated system (10) is provided for identifying alternate low-cost travel arrangements. The system (10) obtains inventory information, specifying the rates and/or availability of a plurality of travel arrangements, from one or more computer reservation systems. The inventory information is stored in a database (14) along with one or more portfolios of information (relating to a travel agency and each business entity customer of the travel agency) that can be used to discount the listed rates of the travel arrangements. In response to travel request information received from a customer, the system (10) automatically retrieves the inventory and/or discount information from the database (14) and determines a plurality of low-cost alternate travel arrangements that are available to the customer. Consequently, a travel agent using the system (10) does not have to spend time manually identifying alternate low-cost travel arrangements.

AUTOMATED SYSTEM FOR IDENTIFYING
ALTERNATE LOW-COST TRAVEL ARRANGEMENTS

TECHNICAL FIELD OF THE INVENTION

5   This invention relates generally to the field of
travel reservation services, and more particularly, to an
automated system for identifying alternate low-cost
travel arrangements and method of operation.

2

BACKGROUND OF THE INVENTION

In many cases, a customer using a travel agency is not absolutely committed to any specific travel plan, but instead may have some flexibility in traveling.

5   One of the services provided by a travel agent is determining whether the customer has any flexibility in traveling, and afterwards, identifying one or more alternate, low-cost travel arrangements that are available to the customer. For example, a customer who
10 states that he/she would like to fly from Houston to New York on Tuesday, October 8th and return on Friday, October 11th may actually be open to returning on Sunday, October 13th instead, if the cost of traveling would thereby be reduced.

15 Previously, this process of identifying alternate low-cost travel arrangements could only be performed manually by the travel agent, and therefore was extremely inefficient. More specifically, a travel agent was required to access one or more computer reservation
20 systems to obtain inventory information, such as availability and/or rates, for a plurality of alternate travel arrangements. Then, the travel agent was required to consider any special provisions that would also reduce the price of traveling (e.g., staying over a Saturday
25 night). Since the travel agent could not serve other customers during the above-mentioned steps, the agent's productivity decreased.

Furthermore, even though a travel agent could become more efficient in the process with experience, it could
30 not be guaranteed that the process would always produce all of the alternate, low-cost travel arrangements. In other words, because so much of the prior process required input and/or calculation by a travel agent, the accuracy of the process was extremely susceptible to
35 human error.

3

Although a prior system for determining low-cost
alternate travel arrangements (i.e., the "Bargain Finder"
system) is available, this prior system operates on only
one computer reservation system (i.e., the SABRE system
5   owned by American Airlines), which does not include
information about all of the possible flights between a
departure city and a destination city. Consequently,
this prior system is not able to consistently find all of
the low-cost alternate flights in response to a
10   customer's request.

SUMMARY OF THE INVENTION

Accordingly, a need has arisen for an automated system that identifies a plurality of alternate low-cost travel arrangements that may be offered or recommended to a customer submitting a travel request to a travel agency.

In accordance with the preferred embodiment of the present invention, an automated system is provided for identifying alternate low-cost travel arrangements. The system obtains inventory information, specifying the rates and/or availability of a plurality of travel arrangements, from one or more computer reservation systems. The inventory information is stored in a database along with one or more portfolios of information (relating to a travel agency and each business entity customer of the travel agency) that can be used to discount the listed rates of the travel arrangements. In response to travel request information received from a customer, the system automatically retrieves the inventory and/or discount information from the database and determines a plurality of low-cost alternate travel arrangements that are available to the customer.

An important technical advantage of the present invention includes automatically determining a plurality of low-cost, available travel arrangements so that a travel agent does not have to spend time manually deriving the same.

Another important technical advantage of the present invention is that the opportunity for human error in identifying alternate low-cost travel arrangements is substantially reduced or eliminated.

5

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, reference may be made to the accompanying drawings, in which:

5   FIGURE 1 is a top level, block diagram of an automated system for identifying alternate low-cost travel arrangements, in accordance with the preferred embodiment of the present invention;

FIGURE 2 is a simplified diagram of a computer-based
10   system that can be used to implement the automated system shown in FIGURE 1;

FIGURE 3 is a flow diagram that illustrates a method of operating the automated system to obtain inventory information from one or more computer reservation
15   systems, in accordance with the preferred embodiment of the present invention; and

FIGURE 4 is a flow diagram that illustrates a method of operating the automated system to identify a plurality of alternate low-cost travel arrangements, in accordance
20   with the preferred embodiment of the present invention.

6

DETAILED DESCRIPTION OF THE INVENTION

The preferred embodiment of the present invention and its advantages are best understood by referring to FIGURES 1-4 of the drawings, like numerals being used for
5   like and corresponding parts of the various drawings.

In accordance with the preferred embodiment of the present invention, an automated system is preferably used to identify a plurality of alternate low-cost travel arrangements that may be offered or recommended to a
10   customer in response to the customer's request. The automated system accesses one or more computer reservation systems in order to obtain inventory information regarding, for example, the availability and listed rates of various travel arrangements such as
15   airline flights, hotel accommodations, and rental cars. The automated system also stores other information, such as, for example, travel discounts available to the employees of a particular business entity, which may be used to reduce the listed rates of the travel
20   arrangements. When the automated system receives a specific travel request from a customer, it retrieves the above-mentioned information and identifies a plurality of alternate, available low-cost travel arrangements. Because the system is automated, a travel agent using the
25   system does not need to manually identify the plurality of alternate, low-cost travel arrangements. Consequently, the travel agent will be able to work more productively. Furthermore, the automated system substantially reduces or eliminates the opportunity for
30   human error.

The following describes primarily how the present invention can find a plurality of alternate, low-cost airline flights in response to a request for airline travel. However, it should be understood that the
35   present invention is not limited to such an exemplary

7

embodiment. Thus, in an alternative embodiment, the
present invention could be used to find a plurality of
low-cost, alternate hotel accommodations, or rental
automobiles in response to a request for hotel or rental
5   automobile service, respectively.

FIGURE 1 is a top level, block diagram that
illustrates an automated system 10 for identifying a
plurality of low-cost alternate travel arrangements, in
accordance with the preferred embodiment of the present
10   invention. Referring to FIGURE 1, the automated system
(hereinafter, referred to as the 'system') 10 is shown.
System 10 includes a processing network 12 connected to a
database 14.

Processing network 12 may consist of a single
15   processor, or as described below with reference to FIGURE
2, a plurality of interconnected processors. Processing
network 12 functions to run one or more software
applications or modules, which can include a parameter
generating engine module 16.

20   Parameter generating engine module 16 preferably
includes two sub-modules or subroutines. The first sub-
module of parameter generating engine module 16, which
can be described as an inventory update sub-module,
preferably functions to direct system 10 to periodically
25   access and retrieve inventory information from one or
more computer reservation systems 24 used by the travel
agency. The inventory update sub-module further
functions to store the inventory information in database
14. The second sub-module of the parameter generating
30   engine module 16, which can be described as an analytical
sub-module, operates independently of the inventory
update module. The analytical sub-module functions to
receive travel request information (which preferably
specifies, for example, a city of d parture, a city of
35   destination, and approximate dates for travel) input into

8

system 10, and in response, identifies one or more
alternate, low-cost travel arrangements that can be
suggested to the customer. For example, in response to a
travel request for an airline flight between Dallas and
5   Chicago on April 25th, the analytical sub-module may
identify the following possible flight alternatives: (1)
a Continental Airlines flight departing on April 23rd
costing $180.00, (2) an American Airlines flight
departing on April 24th costing $220.00, (3) a Delta
10   Airlines flight departing on April 25th costing $350.00,
and (4) an American Airlines flight departing on April
25th for $370.00. Parameter generating engine module 16
may incorporate one or more genetic algorithms (discussed
in more detail below) which function to define sets of
15   parameters used in identifying alternate, low-cost travel
arrangements. The operation of parameter generating
engine module 16 is described below in more detail with
reference to FIGURE 4.

        Database 14 is preferably a relational database,
20   which resides in a data storage medium (to be described
in detail below). A business entity profile 20 is
preferably maintained in the relational database 14 in
system 10, for each business entity customer of the
agency. In addition, the relational database preferably
25   maintains an inventory data structure 18 and a travel
agency profile 22.

        Inventory data structure 18 includes inventory
information obtained from one or more computer
reservation systems 24 used by the travel agency. The
30   customer reservation systems 24 provide travel service
inventory information, such as airline flight, hotel, and
rental automobile availability and rates. For airline
flights, the inventory information may specify all
flights between each particular city of departure and
35   city of destination (otherwise known as a 'city pair'),

9

the arrival and departure times of the flights, the
airline carriers providing such flights, a description of
each flight as either direct or non-direct, the breakdown
of all non-direct flights into separate legs or

5   "segments," the identification of each segment of a flight
as either domestic or international, the fare classes
available on the flights, and pricing information (e.g.,
one-way ticketing, round-trip ticketing, city-to-city
ticketing, or end-to-end ticketing) that can be used to

10   determine the rates of various flights.

Business entity profile 20 preferably contains, at a
minimum, information that is used to determine any
discounts available to a traveler as an employee of a
particular business entity customer of the travel agency.

15   Thus, the business entity profile information may include
any specialized codes used on each computer reservation
system to discount the listed rate of travel arrangements
for employees of the business entity. In addition,
business entity profile 20 preferably contains

20   information regarding restrictions, such as, for example,
fare class restrictions, that a business entity customer
may impose upon its employees for work-related travel.
Furthermore, business entity profile 20 can contain other
information that may reduce the cost of travel

25   arrangements booked in response to a request, such as,
for example, credit for any tickets returned by an
employee of a particular business entity and/or free
tickets earned by a business entity for frequent travel.
The business entity profile 20 may also contain the names

30   of all people employed by each business entity customer
of the travel agency.

Travel agency profile 22 preferably contains, at a
minimum, information relating to the travel agency which
can be used to identify alternate, low-cost travel

35   arrangements available for a particular request. Travel

10

agency profile information thus may include, for example,
any discounts available to the travel agency which can be
passed on to its customers (individual and/or business
entity). This can include inventory for sale exclusively
5   by the travel agency (e.g., space banking) and
promotional discounts.

The plurality of computer reservation systems 24
used by the travel agency can be linked electronically
with system 10. Each computer reservation system 24 may
10   be one or more commercially available computer
reservation systems such as, for example, SABRE° owned by
American Airlines, WORLD SPAN° owned by Pars Marketing,
APOLLO° owned by Galileo International Partnership, or
SYSTEM ONE° owned by Amadeus Global Travel Distribution.
15   Computer reservation systems 24 provide on-line travel
service inventory information.

System 10 receives information relating to an
incoming travel request from a customer. Typically, this
travel request information specifies various parameters
20   for travel, such as, for example, a city of departure and
a city of destination (a city pair), and tentative
times/dates of travel. In response to the travel request
information, system 10 preferably identifies a plurality
of low-cost alternate travel arrangements that are
25   available between the city pair specified by the
customer. If additional parameters (e.g., a particular
airline carrier, fare class, exact date of travel, etc.)
are specified in the travel request information, the
number of alternate travel arrangements will usually be
30   smaller.

FIGURE 2 is a simplified diagram of an exemplary
computer-based system 26 that can be used to implement
the automated system 10 for generating lowest-priced
alternate travel itineraries shown in FIGURE 1.
35   Referring to the embodiment shown in FIGURE 2, the

computer-based system 26 can include a process server 28,
a data storage device 30, a main frame computer 32, a
local file server 34, and a plurality of work stations or
desktop computers 36. Process server 28 preferably

5   functions to process travel-related data and command
information. A SUN SOLARIS 2.3 system has been
successfully utilized as a process server 28. Data
storage device 30 can be a mass storage subsystem of
tapes and/or disk drives, which is electronically coupled

10 to process server 28. In the preferred embodiment, a
relational database resides in data storage device 30.
Consequently, process server 28 may retrieve, process,
and store the information in the relational database
residing in data storage device 30.

15   The mainframe computer 32 may be linked .
electronically to process server 28 through a local or
wide area network (LAN/WAN), for automated uploading and
downloading of information therebetween. Any general
purpose or medium-sized computer, which includes a

20 central processing unit (CPU) and suitable RAM, ROM, and
I/O circuitry can be utilized for mainframe 32.

        Local file server 34 may be linked electronically to
process server 28 by the same or a different local or
wide area network, or by telecommunication lines through

25 a modem (not explicitly shown). Additionally, as shown
(for illustrative purposes only) in FIGURE 2, process
server 28 can be linked by a "gateway" interface
communications processor to local file server 34. Local
file server 34 is preferably connected to a plurality of

30 workstations or desktop computers 36. A user of system
10, such as a travel agent, may input and receive travel-
and-customer related information (including the travel
plan generated by system 10), and system information,
respectively, through any of the workstations 36.

35 Preferably, each workstation 36 is a desktop computer

12

having at least a 486 processor or an operational
equivalent. Systems programming for system 10 may be
performed using a high level programming language, such
as c⁺⁺.

5   The inventory data structure 18, the business entity
profile 20, and the travel agency profile 22 (each of
which contains information that can be used to identify
low-cost alternative travel arrangements) are preferably
stored in the relational database residing in data

10   storage device 30. Process server 28, mainframe computer
32, local file server 34, and workstations 36 are
preferably linked together. Consequently, each of these
devices can directly access (e.g., store and retrieve)
the low-cost travel arrangements information, if

15   necessary.
          FIGURES 3 and 4 are flow diagrams illustrating two
separate methods that can be performed by automated
system 10 during its operation, in accordance with a
preferred embodiment of the invention. Because system 10

20   preferably includes a plurality of processing devices (as
shown in FIGURE 2), the two methods can be performed
simultaneously, each by a separate processing device in
the system. Alternatively, separate processing devices
can be used to perform the two methods, but processing is

25   not necessarily simultaneous. In yet another
alternative, a single processor may alternately perform
both methods.
          FIGURE 3 is a flow diagram that illustrates a method
100 by which automated system 10 periodically obtains

30   information from one or more computer reservation systems
24 and stores this information into database 14.
Preferably, method 100 is automatically performed by
system 10 without input from a system user, such as a
travel agent.

13

At block 102, method 100 is initiated. More specifically, system 10 initiates the inventory update sub-module of parameter generating engine module 16, which controls system 10 throughout performance of method 100.

At block 104, system 10 determines whether a predetermined time has elapsed since inventory information was last obtained from computer reservation systems 24. Preferably, the predetermined time can be set by a user of the system according to the user's needs. For example, a travel agency which desires to have the most current inventory information available can set system 10 to access the computer reservation systems twice every hour. On the other hand, a travel agency which wishes to maintain a low hits-to-bookings ratio for each computer reservation system can set system 10 to access the computer reservation systems twice each day.

If the predetermined time has elapsed, at block 106, system 10, under the control of the inventory update sub-module, reads data from one or more computer reservation systems 24. If system 10 is connected to more than one computer reservation system 24, data can be read from each computer reservation system sequentially so that only one computer reservation system 24 is accessed at any given moment. Alternatively, system 10 can be configured to read data from a plurality of computer reservation systems simultaneously. The data read from the computer reservation systems 24 includes inventory information, such as, for example, all flights between each city pair, airline carriers providing the flights, fare classes available on the flights, a description of each flight as either direct or non-direct, the breakdown of all non-direct flights into separate segments, and the identification of each segment of a flight as either domestic or international.

14

At block 108, system 10 updates the inventory data structure 18 in database 14 using the information obtained from computer reservation systems 24.

At block 110, still under the control of the
5 inventory update sub-module, system 10 trains the genetic algorithms using the updated inventory information. In general, a genetic algorithm is an algorithm capable of repeatedly sifting through a pool of candidate solutions to a particular problem, eliminating those solutions
10 which fail, and adapting/modifying those solutions which succeed. Genetic algorithms are useful when the number of possible solutions is finite, but far too large to search exhaustively. Genetic algorithms require two components: (1) a representation of a possible solution,
15 known as a chromosome; and (2) a fitness function which evaluates how well a proposed solution works (i.e., its "fitness"). In system 10, the genetic algorithms are trained by providing the most current pool of candidate solutions (i.e, the travel arrangements specified in the
20 most recently obtained inventory information) to the genetic algorithms. System 10 then waits for the predetermined time to elapse again (block 104).

FIGURE 4 is a flow diagram that illustrates a method 200 by which the automated system 10 can identify a
25 plurality of alternate, low-cost travel arrangements in response to a travel request submitted by a customer. During the performance of method 200, a user of system 10, such as a travel agent, can communicate with the system, preferably using a workstation 36. For example,
30 an agent can input system commands and travel request information by pressing appropriate keys (typing) on a workstation keyboard, or "clicking" on an option in a WINDOWS-type display. In return, the workstation 36 can display a list of alternate, low-cost travel arrangements
35 identified by system 10.

15

Referring to FIGURE 4, at block 202, method 200 is
initiated. More specifically, system 10 initiates the
analytical sub-module of parameter generating engine
module 16, which controls system 10 throughout the
5   performance of method 200.

At block 204, system 10 receives travel request
information, which may be input by a travel agent. The
travel request information preferably specifies, at a
minimum, a departure city and a destination city (a city
10   pair), and the tentative times and/or dates of travel.
The travel request information may also specify
additional parameters for travel, such as, for example, a
particular airline carrier, fare class, or exact date of
travel. Furthermore, if the customer is new to the
15   travel agency and is traveling for business, system 10
may prompt the agent to input information relating to the
individual customer and the individual's employer, such
as, for example, any frequent flyer program in which the
individual participates and any discounts available to
20   employees of the business entity.

At blocks 206 and 208, in response to the travel
request information, the analytical sub-module directs
system 10 to retrieve business entity and travel agency
profile information from, respectively, business entity
25   profile 20 and travel agency profile 22. It should be
understood, however, that if the individual customer is
not traveling for work-related matters, business entity
information will not be retrieved and used in the
subsequent analysis.

30   At block 210, system 10 inputs the city pair
information, and other parameters specified in the travel
request, into the genetic algorithms. In response to the
input information, the genetic algorithms produce a set
of parameters which can be used to identify travel
35   arrangements that may be suitable for the customer. For

16

example, if the travel request specifies airline travel from Miami to Washington D.C. on Monday, August 5th and returning on Friday, August 9th, then the genetic algorithms may output, at a minimum, the following parameters: (1) for travel from Miami to Washington D.C., an airline flight on any date from Friday, August 2nd to Wednesday, August 7th; and (2) for travel from Washington D.C. to Miami, an airline flight on any date from Wednesday, August 7th to Monday, August 12th. Any additional parameters (e.g., a particular airline carrier, fare class, exact date of travel, etc.) which are specified in the travel request information will also be included in the parameters output by the genetic algorithms.

At block 212, using information retrieved from inventory data structure 18 in database 14, system 10 identifies all of the alternate travel arrangements that fall within the parameters output by the genetic algorithms. With further reference to the Miami-Washington D.C. example described in the previous paragraph, system 10 may identify various possible travel arrangements, including the following: (1) a first American Airlines flight departing from Miami at 8:00 a.m. on Saturday, August 3rd, and a second American Airlines flight returning from Washington D.C. at 3:15 p.m. on Thursday, August 8th; (2) a first Delta Airlines flight departing from Miami at 10:00 p.m. on Friday, August 2nd, and a second Delta Airlines flight returning from Washington D.C. at 5:45 a.m. on Saturday, August 10th; (3) a first Delta Airlines departing from Miami at 4:30 p.m. on Saturday, August 3rd with a layover in Altanta, and a second Delta Airlines flight returning from Washington D.C. at 6:50 p.m. on Wednesday, August 7th with a layover in Atlanta; (4) a first United Airlines flight departing from Miami at 10:30 a.m. on

17

Monday, August 5th, and a second United Airlines flight
returning from Washington D.C. at 11:10 a.m. on Saturday,
August 10th; (5) a first Continental Airlines flight
departing from Miami at 2:45 p.m. on Sunday, August 4th

5   with a layover in Orlando, and a second Continental
Airlines flight returning from Washington D.C. at 7:55
p.m. on Thursday, August 8th; and (6) a American Eagle
flight departing from Miami at 8:35 a.m. on Sunday,
August 4th, and a second American Eagle flight returning

10   from Washington D.C. at 4:50 p.m. on Sunday, August 10th.
If additional parameters (e.g., a particular airline
carrier, fare class, exact date of travel, etc.) are
specified in the travel request information, the number
of alternate travel arrangements will usually be smaller.

15   Thus, referring to the example directly above, if the
travel request had specified that only Delta Airlines
flights should be considered, then the possible travel
arrangements listed above would be reduced by two-thirds
(i.e., only travel arrangements (2) and (3) would have

20   been considered).
System 10 may repeat the steps described above with
reference to blocks 210 and 212 several times in order to
generate different sets of parameters and identify all
travel arrangements falling within each set of

25   parameters.
At block 214, using the business entity profile
information retrieved from database 14, system 10
identifies which of the travel arrangements (falling
within the parameters generated by the genetic

30   algorithms) are provided by a preferred carrier of any
business entity employing the individual traveler. For
example, if a corporation specifies that its employees
should travel only on American Airlines for work-related
matters, system 10 eliminates from consideration all

35   flight arrangements provided by another airline. System

18

10 also identifies which travel arrangements are within the business entity's fare class restrictions. Thus, for example, if a company restricts airline travel to business or coach class seats, system 10 will not

5 consider any available first class seats when identifying alternate low-cost travel arrangements.

At block 216, system 10 prices the remaining travel arrangements. More specifically, information relating to travel arrangements that fall within the applicable

10 business entity's guidelines is input into one or more pricing routines. Using the pricing information from the inventory data structure 18, the pricing routines price each of these travel arrangements by evaluating various aspects of each arrangement. For example, international

15 segments (i.e., flight legs originating in one country and arriving in another) are priced separately from domestic segments (i.e., flight legs originating and arriving in the same country). Furthermore, different ticketing options, such as, one-way ticketing, round-trip

20 ticketing, city-to-city ticketing, or end-to-end ticketing, are priced separately.

At block 218, the analytical sub-module directs system 10 to generate a table of the remaining travel arrangements according to the prices determined by the

25 pricing routine(s). The table may be preferably structured to include, at a minimum, the price of each travel arrangement, the airline carrier for each travel arrangement, and the times/dates of travel. Preferably, the travel arrangements are listed in order of ascending

30 price so that the lowest-cost travel arrangement appears at the beginning of the table and the highest-cost travel arrangement appears at the end of the table. The table can be stored in th relati nal database.

At block 220, system 10 outputs the table of

35 alternate low-cost travel arrangem nts to a user of the

19

system, for example, by displaying the table on a
workstation 36. At block 222, method 200 is terminated.
Once the travel agent has informed the customer making
the request about the available low-cost alternate travel

5   arrangements and the customer has selected a particular
travel arrangement, system 10 may also be used to
automatically make the reservations by accessing an
appropriate computer reservation system 24.

In the manner described above, system 10

10   automatically identifies alternate, low-cost travel
arrangements in response to a travel request. Thus, a
travel agent is not required to manually determine the
available low-cost arrangements, thereby increasing the
agent's productivity. Furthermore, human error is

15   substantially reduced or eliminated from the process.

Although the present invention and its advantages
have been described in detail, it should be understood
that various changes, substitutions, and alterations can
be made therein without departing from the spirit and

20   scope of the invention as defined by the appended claims.

20

WHAT IS CLAIMED IS:

1.   An automated system for identifying alternate
low-cost travel arrangements, comprising:
      a database operable to store business entity profile
5   information, travel agency profile information, and
computer reservation system inventory information; and
      a processor operable to:
      retrieve inventory information from a plurality of
computer reservation systems;
10   store said inventory information in said database;
      in response to receipt of travel request
information, access said database to retrieve travel
agency profile information and computer reservation
system inventory information; and
15   identify at least one low-cost travel arrangement.

      2.   The system of Claim 1, wherein said processor
is further operable to access said computer reservation
systems at a predetermined interval.
20

      3.   The system of Claim 1, wherein said database
comprises a relational database.

      4.   The system of Claim 1, wherein said processor
25   comprises a file server.

      5.   The system of Claim 1, wherein said processor
is further operable to generate at least one set of
travel parameters.
30

      6.   The system of Claim 1, wherein said processor
is further operable to retrieve business entity profile
information in response to receipt of travel request
information.
35

21

7.   The system of Claim 1, wherein said processor
is further operable to automatically book travel
reservations on said computer reservation systems.

22

8.   An automated system for identifying alternate
low-cost travel arrangements, comprising:
        a database operable to store business entity profile
information, travel agency profile information, and
5   computer reservation system inventory information; and
        a processing network connected to the database and
operable to:
        access a plurality of computer reservation systems
and retrieve computer reservation system inventory
10   information;
        store said retrieved computer reservation inventory
information in said database;
        receive travel request information specifying a
travel itinerary;
15   access said database to retrieve travel agency
profile information and computer reservation system
inventory information in response to said received travel
request information;
        generate at least one set of travel parameters in
20   response to said received travel request information; and
        identify at least one alternate low-cost travel
arrangement.

        9.   The system of Claim 8, wherein said database is
25   a relational database.

        10.   The system of Claim 8, wherein said processor
is further operable to access the computer reservation
systems at a predetermined interval.

30

        11.   The system of Claim 8, wherein said processor
is further operable to access said database to retrieve
business entity profile information in response to said
received travel request information.

23

    12.   The system of Claim 8, wherein said processor
is further operable to automatically book travel
reservations on at least one of said computer reservation
systems.

5

24

13. A method for automatically identifying
alternate low-cost travel arrangements, comprising:
accessing a plurality of computer reservation
systems and retrieving computer reservation system
5   inventory information;
generating business entity profile information and
travel agency profile information;
storing said retrieved computer reservation system
inventory information and said generated business entity
10   profile and travel agency profile information in a
database;
receiving travel request information;
retrieving from said database said computer
reservation system inventory information and said travel
15   agency profile information in response to said received
travel request information; and
identifying at least one alternate low-cost travel
arrangement.

20   14. The method of Claim 13, wherein said accessing
step further comprises the step of accessing the computer
reservation system at a predetermined interval.

15. The method of Claim 13, further comprising the
25   step of generating at least one set of travel parameters
in response to said received travel request information.

25

16. The method of Claim 13, wherein said identifying step further comprises the step of identifying which of a plurality of alternate travel arrangements is within a particular business entity's guidelines.

17. The method of Claim 13, wherein said identifying step further comprises the step of pricing alternate travel itineraries.

18. The method of Claim 13, further comprising the step of retrieving from said database said business entity profile information in response to said received travel request information.

19. The method of Claim 13, further comprising the step of booking a travel reservation on said computer reservation systems.

20. The method of Claim 13, further comprising the step of displaying said alternate low-cost travel arrangement to a user.
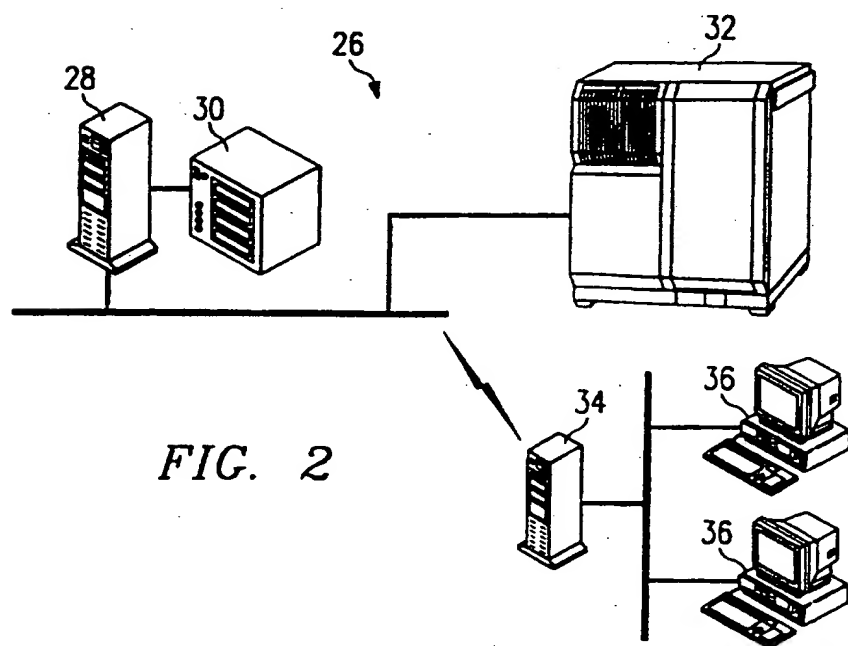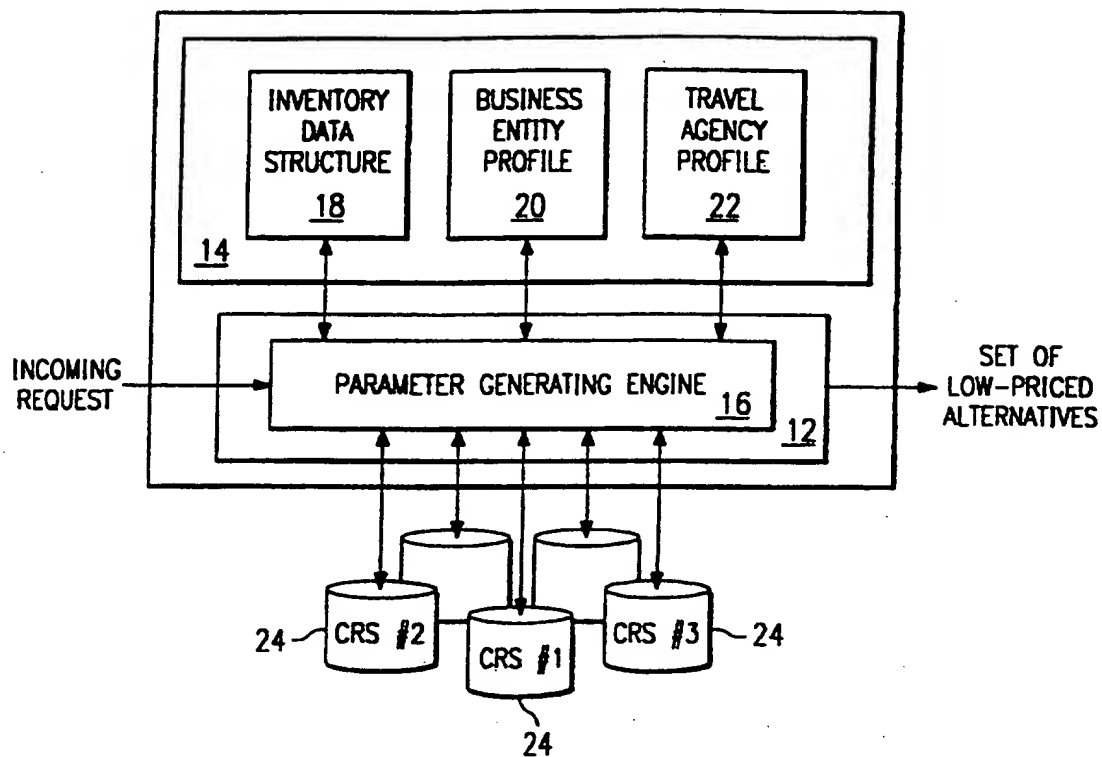
1/2

FIG. 1

INCOMING REQUEST

SET OF LOW-PRICED ALTERNATIVES

INVENTORY DATA STRUCTURE _18_

BUSINESS ENTITY PROFILE _20_

TRAVEL AGENCY PROFILE _22_

_14_

PARAMETER GENERATING ENGINE _16_   _12_

CRS #2   CRS #1   CRS #3   24   24

24

FIG. 2

26   28   30   32   34   36   36

INTERNATIONAL SEARCH REPORT

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 9310502 A	27-05-93	US AU CA	5237499 A 3066292 A 2123230 A	17-08-93 15-06-93 27-05-93
US 5253166 A	12-10-93	NONE		
EP 0690398 A	03-01-96	JP CN	8016619 A 1121217 A	19-01-96 24-04-96
US 5021953 A	04-06-91	US	5331546 A	19-07-94